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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
BEFORE THE COMMISSION

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OFFICE OF SECRETARY  
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WASHINGTON, D.C.

In the Matter of	)	
	)	
PACIFIC GAS AND ELECTRIC COMPANY	)	Docket Nos. 50-275 O.L.
	)	50-323 O.L.
(Diablo Canyon Nuclear Power	)	
Plant, Units 1 and 2)	)	
	)	

JOINT INTERVENORS' RESPONSE  
TO APRIL 3, 1984 ORDER RE  
EARTHQUAKES AND EMERGENCY PLANNING

By Order dated April 3, 1984, the Commission invited responses by all parties to a series of questions regarding the right to hearing under the Commission's regulations on the issue of the complicating effects of a major earthquake on response to a radiological emergency at Diablo Canyon Nuclear Power Plant ("Diablo Canyon"). The Joint Intervenor hereby respond to that Order.

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1. Whether NRC emergency planning regulations can and should be read to require some review of the complicating effects of earthquakes on emergency planning for Diablo Canyon --

Yes. Section 50.47(a) of 10 C.F.R. Part 50 requires emergency plans that can and will be implemented in the event of a radiological emergency, as well as reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. As even the NRC Staff and the San Onofre licensing board have recognized, one of the unique dangers to California nuclear plants is the potential for major earthquakes, and consequently the effects of such an earthquake on emergency response must be addressed. As the memoranda attached to the Commission's Order indicate, the regulations and the implementing criteria set forth in NUREG-0654 have been interpreted to require consideration of a number of site-specific hazards -- e.g., flooding, tornados, etc. -- even though the regulations themselves do not explicitly require such consideration.

That kind of approach at Diablo Canyon with respect to earthquakes is necessary in order to provide the requisite reasonable assurance that the various emergency plans can and will be implemented in the event of a radiological emergency. Because such an emergency may be caused by or occur proximate in time to a major earthquake on the Hosgri Fault, the Commission's refusal to address this issue constitutes an arbitrary disregard of a concededly significant safety issue within the meaning of

the Commission's regulations. The importance of this issue has been dramatically illustrated by the major earthquakes that have occurred within the past two years in central and coastal California -- in particular, the devastating Coalinga quake and the recent 6.2M quake in the San Jose area.

2. If the answer to question (1) is no, should such a review be performed for Diablo Canyon on the ground that it presents special circumstances under 10 C.F.R. 2.758? If so, what are the special circumstances that would permit consideration of the effects of earthquakes on emergency planning for Diablo Canyon?

Even if the Commission were to conclude erroneously that the regulations do not require such consideration, the issue should be considered under 10 C.F.R. § 2.758 because of the special circumstances generally recognized to be associated with Diablo Canyon's mistaken siting adjacent to a major earthquake fault. Although PGandE continually denigrates the significance of this siting error -- as well as the significance of the ensuing flawed redesign -- the fact remains that Diablo Canyon, unlike any other facility in the country, is grounded upon a fundamental miscalculation of the degree of seismic risk associated with its location. This fact has necessitated major backfitting and reanalysis of the plant's design to such an extent that the ACRS concluded in 1978 that the plant is designed to criteria "less conservative" than would be applicable to a new plant. Thus, its missiting and flawed

design constitute special circumstances that warrant unique consideration regardless of the Appeal Board's heavily contested approval of the seismic design basis.

One issue particularly deserving of special consideration is the potential complicating effect of a major earthquake on response to a radiological emergency at Diablo Canyon. This fact has been recognized even by PGandE in its On-Site Emergency Plan, at Table 4.1-1, p. 15, where it includes as one of the initiating events an "earthquake greater than the SSE." Further, the recent occurrence of several major earthquakes in central California has demonstrated the real potential for such an event; thus it is precisely the kind of issue that must be addressed consistent with the lessons learned from the TMI accident. Specifically, the Kemeny Commission concluded that the near disaster at TMI demonstrated the need to do everything possible to prevent accidents but also to assume that they will occur and be prepared to respond. That principle is applicable here to the issue of earthquakes and emergency planning.

3. If the answer to (1) or (2) is yes, then the following information should be provided:

(a) The specific aspects of emergency planning at Diablo Canyon on which the impacts of earthquakes should be considered.

Prior to operation at any level of power, the following aspects of emergency response should be considered

with respect to the impacts of earthquakes:

§ 50.47(b) (1), (2), (3), (4), (5),  
(6), (7), (8), (9), (10), (12),  
(13), (14), and (15); Appendix E.

Virtually each of the 50.47(b) standards should be addressed with regard to this issue to ensure that sufficient trained personnel and equipment will be available despite earthquake complications. Although such aspects as communications, transportation, public education, staffing, and evacuation are the most fundamental, the other aspects should not be viewed in isolation from the possible consequences of an earthquake.

(b) The specific deficiencies in the consideration already given to the impacts of earthquakes on emergency plans for Diablo Canyon.

There has been no consideration of the impacts of earthquakes on emergency planning in the Diablo Canyon proceeding, because such consideration was cut short by the Commission in December 1981. Consistent with that action, any reference to earthquakes in the context of emergency planning was held irrelevant and inadmissible by the licensing board during the emergency planning hearings held in January 1982. As a result, it is impossible to know (1) whether any serious considerations has been given to the issue informally, and (2) if so, whether that consideration has been based on accurate, realistic information and assumptions. The efforts by

the Joint Intervenors and Governor Brown to get answers to those questions have been rejected by the NRC.

Although PGandE has submitted a TERA study purporting to address the issue, it has never been subjected to the scrutiny of the hearing process, nor have its authors had to defend their assumptions, findings, and conclusions. As such, it must be viewed merely as an untested study submitted by PGandE in support of its application. Some of the obvious deficiencies in the TERA study include, but are not limited to, the following:

(1) No consideration of the effects of an earthquake on the Hosgri Fault beyond the SSE, thus ignoring precisely the issue posed by the San Onofre licensing board and the initiating event prescribed in PGandE's own emergency plan;

(2) Underestimation of the peak ground acceleration expected from the earthquake considered, thereby underestimating the potential damage throughout the Basic Emergency Planning Zone ("Basic EPZ") and the Extended Emergency Planning Zone ("Extended EPZ");

(3) Underestimation of the times necessary to evacuate in the event of a nuclear accident complicated by seismic impacts, as well as the times necessary to conduct repairs, clear up accidents, reconstruct bridges, clear roads, or restore damaged communications or power sources;

(4) Overestimation of the manpower and equipment available to conduct such repairs, etc., as well as a



failure even to consider the possibility that shortages and breakdowns may occur;

(5) Use of erroneous ground motion criteria in that TERA failed to consider a duration consistent with the duration of long period motion associated with the Hosgri earthquake, thereby underestimating the degree of potential damage to structures and soils responsive to such motion;

(6) Failure to consider potential damage to critical arteries adjacent to other active faults to the north, south and east of the City of San Luis Obispo (e.g., San Andreas, Rinconada);

(7) Failure to address the recent discovery that, contrary to TERA's assumption, the Hosgri Fault may be a "thrust fault" that angles down under the plant, thereby increasing expected accelerations and the potential damage resulting from the quake both onsite and in surrounding areas;

(8) Failure to address the possibility that the Emergency Broadcast System ("EBS") power supplies could be damaged, as well as the power systems for planned backups, thereby threatening total loss of EBS;

(9) Failure to ensure prompt public notification in that sirens for the Early Warning System ("EWS") -- many of which are mounted on telephone poles -- and their associated cables and wiring have not been seismically qualified;

(10) Failure to consider adequately the impact of the Hosgri quake on dams and flooding adjacent to or within the evacuation area, thereby underestimating the possible increased complications on emergency response.

(11) Failure to demonstrate that critical equipment in the emergency facilities (e.g., TSC, EOF, EOC) will be available and function in the event of a major earthquake;

(12) Failure to demonstrate that the necessary communications systems will be operable throughout the Extended EPZ during and after a major earthquake, particularly in light of the significant conceded deficiencies in the County's communications system;

(13) Failure to demonstrate coordination between TERA's earthquake planning and that of state and local planners and officials;

(14) Underestimation of damage to bridges and roads from landslides, etc., in light of underestimation of peak ground acceleration;

(15) Unjustified assumption that emergency workers and the public will "do what they are told," will act rationally, and will be available to perform emergency functions during major earthquake and radiological emergency.

These specific deficiencies are illustrative rather than comprehensive. Their sum effect, however, is to undermine the assumptions relied upon and conclusions reached by TERA in its study of earthquakes and emergency planning. As the Joint



Intervenors have repeatedly emphasized, the hearing is the only forum in which those conclusions and assumptions can be fully scrutinized.

(c) The appropriateness of limiting to the Safe Shutdown Earthquake the magnitude of the largest earthquake to be considered.

The rationale of the San Onofre licensing board in rejecting a proposed limitation to the SSE is directly responsive to this question:

While the staff position is an arguable one, we believe that a developed factual record may show it to be inconsistent with the finding we are being called upon to make -- "reasonable assurances that adequate protective measures can and will be taken" at San Onofre "in the event of a radiological emergency." 10 CFR 50.47(a)(1). To be sure, the SSE concept is the linchpin in the seismic design of the plant. See 10 CFR Part 100, Appendix A, V(a)(1). But it is an engineering and design concept; it does not necessarily have anything at all to do with emergency planning. The different rules establishing the SSE and emergency planning requirements (10 CFR 50.47) do not even refer to each other. Yet the Staff has decided to transplant the SSE concept from the design area to the emergency planning area without, in our judgment, an adequate demonstration that the circumstances are sufficiently similar.

Contrary to the Staff's approach here, it has long been established that different accidents may be postulated for different regulatory purposes. "The use of successively increasing conservatism in postulated accidents contributes an added measure of protection to the public health and safety." Vermont Yankee Nuclear Power Corp., 8 AEC 809, 812 (1974). We have before us the question whether the SSE, as previously assigned for design purposes, provides acceptable assurance for the

protection of the public health and safety. Even more severe earthquakes should not be postulated for design purposes without a substantial factual showing. But it does not follow that an earthquake more severe than [sic] the SSE -- severe enough to damage the facility -- should not be postulated for the entirely separate purposes of emergency planning. Although it is extremely unlikely, an earthquake in excess of the SSE could conceivably occur near the facility. If that were to happen, we should assume for regulatory purposes that it could cause a large radioactive release at the plant and, simultaneously, heavy damage to communications facilities and highway evacuation routes. In a seismic area like California, an Applicant and nearby jurisdictions can at the very least be required to consider what they would do in such an event, and to make appropriate plans consistent with reasonable cost projections.

San Onofre, Order (Raising on the Board's Motion on Issue Concerning Earthquakes and Emergency Planning) at 2-3 (July 29, 1981).

Several circumstances suggest that an earthquake beyond the SSE is a real possibility at Diablo Canyon and must be considered. First, the discovery that the Hosgri may be a "thrust fault" rather than a "strike-slip fault" increases the expected force of the quake. Second, the Coalinga quake occurred on a fault not previously recognized as posing a major seismic risk, thus indicating the uncertainties associated with seismic risk assessment. In addition, the Diablo Canyon on-site emergency plan lists as one of the initiating events the occurrence of an "earthquake greater than SSE levels." See PGandE Emergency Plan at Table 4.1-1, p. 15. Thus, even PGandE has in the past recognized the need to consider an earthquake beyond the SSE in connection with its emergency response

planning. Despite even this, however, the adequacy of its planned response to such an event has never been a permissible subject for consideration in this proceeding in light of the Commission's San Onofre decision reversing the licensing board.

Finally, the assumption that the SSE is the limiting event could, if carried to its extreme, eliminate altogether the need even to consider earthquakes and emergency planning. If one assumes that without question the plant will shut down safely under SSE conditions, there would be no need for emergency response. Such a position ignores, of course, the lessons of TMI and the basic purpose of and need for emergency planning. Because an earthquake beyond the SSE would "dominate the accident risk," it must not be excluded from emergency planning consideration.

(d) The substantive criteria for reviewing the effects of earthquakes on emergency planning.

The substantive criteria applicable to this issue should be the same as those applicable to emergency plans generally. No exception from those criteria is authorized by the regulations, and, indeed, no such exception is warranted. "Reasonable assurance that adequate protective measures can and will be taken" and plans that "can and will be implemented" are the applicable standards despite the missiting of the facility adjacent to a major earthquake fault. As with any other unique natural characteristics, earthquakes at Diablo Canyon are a hazard that must be addressed; if the regulatory standards

cannot be met, no operating license may be issued. 10 C.F.R. § 50.47(a).

(e) The necessity for litigation of this matter, including the general scope of (i) proceedings, if any, that should be held, and (ii) issues that should be litigated.

As discussed above, this issue has been excluded from the Diablo Canyon proceeding. As a result, the Joint Intervenors have been deprived of their right to a hearing under § 189(a) of the Atomic Energy Act on a significant safety issue. Consistent with the purpose of that provision, the Joint Intervenors respectfully submit that the right to hearing is the only way in which the public has input into the licensing process or an impact on the adjudication of the license application. The importance of this right has been amply demonstrated throughout this proceeding by the failure of the NRC Staff and PGandE to properly resolve critical safety issues, such as siting, seismic design, quality assurance, and emergency planning. Thus, the question of earthquakes and emergency planning must be addressed in the hearing context (discovery, cross-examination, witnesses) and cannot be left to the Staff to review.

The hearing scope and issues to be litigated should encompass a demonstration by the applicant that it has complied with the Commission's emergency planning regulations even in the event of seismic complications on emergency response. The



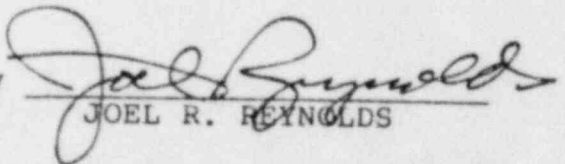
applicant's burden of proof would extend to each of the Appendix E and § 50.47(b) standards potentially affected by such complications (see discussion supra), and would be limited solely to those aspects of emergency planning. Because hearings have already been held on the emergency planning issue generally, other aspects need not be reopened absent an independent showing meeting the the Wolf Creek standards.

Dated: May 3, 1984

Respectfully submitted,

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PACIFIC GAS AND ELECTRIC COMPANY )

(Diablo Canyon Nuclear Power  
Plant, Units 1 and 2) )

Docket Nos. 50-275 O.L.  
50-323 O.L.

CERTIFICATE OF SERVICE

I hereby certify that on this 3rd day of May, 1984, I have served copies of the foregoing JOINT INTERVENORS' RESPONSE TO APRIL 3, 1984 ORDER RE EARTHQUAKES AND EMERGENCY PLANNING, mailing them through the U.S. mails, first class, postage prepaid, to the attached list.

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